

A SURVEY OF THE GUT PARASITES OF RODENTS IN NSUKKA ECOLOGICAL ZONE

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ABSTRACT

*A survey of gut parasites of rodents was undertaken in Nsukka ecological zone. Out of the 87 rodents caught and examined, 47 (54.0%) were positive for helminth parasites. The prevalence rates for the various rodents examined were 60.0% for *Xerus erythropus* (squirrels); 59.3% for *Cricetomy* sp. (giant rats) and 48.9% for *Rattus rattus* (house rats). The difference in prevalence rates amongst the rodents was statistically insignificant ($P > 0.05$). The parasites isolated were 2 Cestode species- *Hymenolepis* sp (17.2%) and *Raillietina* sp; 3 nematode species- *Trichuris muris* (9.2%), *Ascaris* sp (2.3%), *Cyathostomum* sp (4.6%) and one Acanthocephalan- *Moniliformis morniliformis*. (6.9%).*

Keywords: Rodents, *Xerus erythropus*, *Cricetomy* sp, *Rattus rattus*, Gut parasites, *Hymenolepis* sp, *Raillietina* sp, *Trichuris muris*, *Ascaris* sp, *Cyathostomum* sp, *Moniliformis morniliformis*

INTRODUCTION

Rodents are hosts to a number of ectoparasites such as lice, mites and ticks that can transmit viral, bacterial and protozoan parasites to man and animals (Soliman *et al.*, 2001). In addition, they can harbour many different protozoan and helminthic endoparasites (Mafiana *et al.*, 1997; Mahid, 2003). Other than the tremendous economic losses to agriculture owing to their pestiferous nature, rodents survive and proliferate in close association with humans in households, agricultural and commercial places, thus making them interesting subjects for research. Although there are several reports on rodent parasites in other parts of the world, documented studies in Nigeria are wanting. Rodents are the most successful of modern mammals other than man. They make up the largest order of mammals, with over 40% of mammalian species belonging to the order Rodentia (Carleton and Musser, 2005). Their success is probably due to their small size, short breeding and ability to gnaw and eat a wide variety of foods. There are about 2,277 species of rodents, about 42% of all mammal species (Wilson and Reeder, 2005). Rodents are important in many ecosystems because they reproduce rapidly, and can function as food source for predators, mechanisms for seed dispersal and as disease vectors. Humans used rodents as a source of fur, as model organism in animal testing for food and even in detecting landmines. Furthermore, rodents may act as reservoir hosts for important human parasitic diseases. The importance of rodents as a source food for man and their possible roles as a source of pathogens therefore necessitates a study of their parasites.

The helminth parasites of rodents are the cause of disease in man and other farm animals and these have resulted in great mortality of them. And because of this, there is a great need for more research on helminth parasites of rodents. Thus,

knowledge of these parasites of rodents in a community is of both veterinary and public health importance. In this paper, we present our findings on the biodiversity of parasites in rodents caught in Nsukka ecological zone.

MATERIALS AND METHODS

Study Area: The study area is Nsukka local Government Area of Enugu State, Nigeria. Nsukka is located at latitude 6°51'N and longitude 7° 27'E. The landmass and topography is characterised by hill and grasslands where rodents are widely distributed. Community clusters were chosen by random sampling for the present study.

Sample Collection: A total of 87 rodents made up of 27 giant rats (*Cricetomys* sp); 45 house rats (*Rattus rattus*) and 15 squirrels (*Xenus erythropus*) were used for this study. The giant rats and squirrels were obtained by trapping in bushes within the study area while the house rats were caught in living houses and food stores. Those caught alive were kept in iron cages at the University of Nigeria Nsukka Zoological Garden prior to dissection.

Examination for Gut Parasites: The body cavities of the rodents were slit open from throat to the anus to expose the internal organs. The organs of interest viz. oesophagus, stomach, small and large intestines were severed in the above order and placed in clean, white Petri-dishes and immersed in 5% formal saline. Parasites isolated were identified using guide by Bush *et al.* (2001).

RESULTS

Out of the 87 rodents examined, 47 were infected by different helminth parasites. The overall prevalence rate was 54.0 % (Table 1).

Table 1: Prevalence of helminth parasites of rodents in Nsukka ecological zone

Rodent species No Exam.	<i>Hymenolepis</i> sp.	<i>Raillietina</i> sp.	<i>Trichuris</i> <i>muris</i>	<i>Ascaris</i> sp.	<i>Cyathostomium</i>	<i>M.</i> <i>morniformis</i>	Total
<i>Cricetomys</i> sp 27	54	3	3	1	2	2	16(59.3)
<i>Rattus rattus</i> 45	78	5	5	1	1	2	22(48.9)
<i>Xenus erythropus</i> 15	2	-	4	-	1	2	9(60.0)
Total 87	15(17.2)	8(9.3)	12(13.8)	2(2.3)	4(4.6)	6(6.9)	47(54.0)

The helminth parasites were demonstrated in the small and large intestines while the oesophagus and stomach of all the rodents were free of parasites. The prevalence rates for the various rodents examined were 60.0% for *Xerus erythropus* (squirrels); 59.3 % for *Cricetomys* sp. (giant rats) and 48.9 % for *Rattus rattus* (house rats). The difference in prevalence rates amongst the rodents was statistically insignificant ($P > 0.05$). The parasites isolated were 2 Cestode species- *Hymenolepis* sp. (17.2 %) and *Raillietina* sp; 3 nematode species- *Trichuris muris* (9.2 %), *Ascaris* sp. (2.3 %), *Cyathostomum* (4.6 %) and one Acanthocephalan- *Morniliformis morniliformis* (6.9 %).

A total of 48 out of the 87 rodents were males and 39 were females. Prevalence rate of parasites in males was 56.3 % while 51.3 % of the females were infected (Table 2). The difference in infection rates by sex of rodents was statistically insignificant ($P > 0.05$).

Table 2: Prevalence of helminth parasites by sex of rodents in Nsukka ecological zone

Helminth sp.	Males n=48	Female n=39	Total n=87
<i>Hymenolepis</i> sp	9 (18.8)	6(15.4)	15(17.2)
<i>Raillietina</i> sp	4(8.5)	4(10.3)	8(9.2)
<i>Trichuris muris</i>	7(14.6)	5(12.8)	12(13.8)
<i>Ascaris</i> sp	2(4.2)	0(0.0)	2(2.3)
<i>Cyathostomum</i>	3(6.3)	1(2.6)	4(4.6)
<i>M. morniliformis</i>	4(8.3)	2(5.1)	6(6.9)
Total	27 (56.3)	20 (51.3)	47 (54.0)

DISCUSSION

The study has revealed the extent of parasite biodiversity in Nsukka ecological zone which is vast and diverse. The public health implications is important when it is remembered that all the rodents studied also serve as veritable sources of animal protein in the study area and neighbouring Benue and Kogi States.

The helminth parasites recorded in this study are similar to those of related studies elsewhere (Mafiana *et al.*, 1997; Ajayi *et al.*, 2007). There was however the striking absence of the cestode- *Taenia taeniaformis* (lyst) demonstrated in the above surveys.

The result of the present survey has shown the cestode parasite, *Hymenolepis* sp. (17.2 %) and the nematode, *Trichuris muris* (9.2 %) as the most

important parasites of rodents in Nsukka ecological zone. The rate of infections demonstrated among the males (56.3 %) and female (51.3) rodents by sexes that expose them to helminth parasite infection.

Despite heavy infection with intestinal parasites, and marked hepatic tissue damage owing to severe capillariasis and strobilovercus larva infection, all rats appeared healthy and agile, suggestive of a well- established rat host-parasite relationship. In view of the diversity and zoonotic nature of rat parasites, and the impoverished conditions prevailing in communities where *Rattus* spp survive and proliferate, they can readily facilitate parasite transmission to humans and other susceptible animal hosts.

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